Award Number: W81XWH-09-1-0282

TITLE: "Georgetown University and Hampton University Prostate Cancer Undergraduate Fellowship Program"

PRINCIPAL INVESTIGATOR: Anna Riegel, PhD

CONTRACTING ORGANIZATION: Georgetown University
Washington, DC 20057

REPORT DATE: September 2014

TYPE OF REPORT: Final Annual Summary Report

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
September 2014	Final Annual Summary Report	1 Sept 2009 - 30 Sept 2013

4. TITLE AND SUBTITLE
Georgetown University and Hampton University Prostate Cancer Undergraduate Fellowship Program

5a. CONTRACT NUMBER

5b. GRANT NUMBER
PC081394

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Anna Riegel, PhD (Georgetown)

Nicholas Kenney, PhD (Hampton)

E-Mail: ariege01@georgetown.edu

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Georgetown University
Department of Oncology
Research Building, Room E307
3970 Reservoir Road NW
Washington, DC 20057

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The training grant has two goals. The first goal is to integrate the students from Hampton University (HU) into the Prostate Center through research, lectures, seminars, and clinical exposure. The second goal is to attract talented HU students into th graduate prostate cancer program at GU. To achieve these goals, the training program is divided into two parts. Part I (8-12 weeks) consists of a mentored summer research experience at GU in the laboratory of a training faculty and attendance of lectures, seminars, and journal club. Attendance on clinical rounds and at clinical conferences on prostate cancer allows the trainees to follow prostate cancer patients through treatment. In addition, the trainees attend the weekly graduate school preparation session and are scheduled to take the GRE general and subject tests. During the academic year, part II consists of an educational and research component that enhances the prostate cancer training of the students through enrollment in H BIO408 – Research Problems. During the third year of funding, four students from HU conducted research on the mechanis of action of novel drugs that sensitize prostate tumors to radiation treatment; on the role of BRCA1 and oxidative stress in prostate cancer; on the role of the hippo-yap pathway in the proliferation of prostate cancer; and on the metabolomic profile o prostate cancer. The students are currently enrolled in the Research Problems course and scheduled to take the GRE exam

15. SUBJECT TERMS

Nothing listed

16. SECURITY CLASSIFICATION OF:	17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSO
			USAMRMC

a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER *(include ar code)*
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INTRODUCTION

The Lombardi Cancer Center (LCC) at Georgetown University (GU) is a National Cancer Institute designated Comprehensive Cancer Center. The Prostate Center at LCC is a multidisciplinary clinic where physicians and scientists interact to advance state-of-the-art treatment of patients with the goal of curing prostate cancer and maximizing quality of life. Urological surgeons, radiation oncologists, population scientists, medical oncologists, patient advocates, and basic scientist work together to develop clinical protocols that translate laboratory and technical discoveries to the clinic. Scientists at the Prostate Center are working to discover the molecular causes of prostate cancer and the population-wide impact of the disease. Their research is grouped into several thematic areas including prevention, detection and diagnosis, advancing treatment, and survivorship. Hampton University (HU), founded in 1869, is a dynamic, progressive institution of higher education that is a privately endowed, non-profit, non-sectarian, co-educational, historically black university. The Department of Biological Sciences has over 400 students and offers both the B.Sc and M.Sc. degrees. The Department is second among HBCU's in the number of B.Sc. degrees granted and is ranked nineteenth among all schools in the U.S. The Department boasts a 100% retention rate.

BODY

The training grant has two goals. The first goal is to integrate the students from Hampton University (HU) into the Prostate Center through research, lectures, seminars, and clinical exposure. The second goal is to attract talented HU students into the graduate prostate cancer program at GU. To achieve these goals, the training program is divided into two parts. Part I (8-12 weeks) consists of a mentored summer research experience at GU in the laboratory of a training faculty and attendance of lectures, seminars, and journal club that provides a

comprehensive scientific foundation in prevention, etiology, and initiation of prostate cancer through the progression and metastasis of the disease. Attendance on clinical rounds and at clinical conferences on prostate cancer allows the trainees to follow prostate cancer patients through treatment. In addition, the trainees attend the weekly graduate school preparation session and are scheduled to take the GRE general and subject tests. During the academic year, part II consists of an educational and research component that enhances the prostate cancer training of the students through enrollment in HU BIO408 – Research Problems. This class consists of seminars/lectures given, in part, by the GU training faculty. In addition, the HU faculty oversee a prostate cancer research project that addresses the epidemiological link between environmental exposures and an increased risk of developing prostate cancer.

ACCOMPLISHMENTS September 2011 to September 2013

Aim – Foster collaborations between Georgetown University and Hampton University that will lead to the recruitment of Hampton University undergraduate students into the prostate cancer training program at Georgetown University Medical Center.

Four of the Hampton University students are or were enrolled in graduate programs at Georgetown University. An additional seven students are enrolled in graduate programs at major research universities.

Task 1. Recruitment of Hampton University undergraduate students:

A. Recruitment:

1. Dr. Kenney recruited four second and third year undergraduate students from the Department of Biological Sciences at Hampton University for the summers of 2010-2013. A total of 23 fellows and volunteers were recruited over the four years.

B. Selection:

1. The students were selected based on their research interests, overall and science GPA, and letters of recommendation.

Task 2. Placement of Hampton University undergraduate students in Georgetown University mentor's laboratory:

1. Each year, the Deputy Associate Director of Cancer Research Education (Dr. Martin) traveled to Hampton University during the fall academic semester and presented an overview of the prostate cancer research at Georgetown University. Based on their research interest, the Hampton students indentified potential mentors in the GUMC prostate program.

2. Potential Georgetown University mentors were then contacted. Hampton University students were also be given the contact information of undergraduate, graduate, and postdoctoral trainees in the mentor's laboratory and encouraged to contact the mentor's trainees.

Task 3. Georgetown University provided a summer research and training program for Hampton University undergraduate students:

1. The Hampton University undergraduates (Eugide Othepa, Beverly Uweh, Reena Blade, and Emmen Udoh) conducted prostate cancer research (8 - 12 weeks) in the laboratory of a Georgetown University mentor (Drs. Collins, Yi, Rosen, and Dritshcilo).

2. Hampton University trainees participated in and presented their research at weekly laboratory research data meetings.

3. The trainees attended the weekly Brown Bag Lunch Lecture Series. Series 1 met on Tuesday and covered the biology of prostate cancer. Series 2 met on Thursday and covered bioinformatics.

4. The trainees also attended Oncology Grand Rounds, the weekly Oncology Journal Club and Seminar, and the weekly Oncology Faculty Seminar.

5. Trainees attended a weekly graduate school preparation session and were scheduled to take the GRE general and subject tests in the fall. For example, the trainees from the summer of 2011 (Kara Johnson, Chantel Johnson, Reena Blade, and Emem Udoh) took the tests in the fall of 2011.

Task 4. Georgetown University faculty participated in teaching the Hampton University undergraduate course HU BIO408 – Research Problems:

1. Hampton University undergraduate students who participated in the summer of 2011 enrolled in HU BIO408 Research Problems. Dr. Kenney's HU408 course presented various aspects of clinical and basic cancer research in a lecture format (50 minutes).

Task 5. Hampton University faculty advisor provided prostate cancer research opportunities for the undergraduate trainees:

1. The Hampton University faculty advisor, Dr. Kenney provided in vitro prostate cancer research opportunities during the academic year for the undergraduate trainees via enrollment in HU BIO408 Research Problems.

Task 6. Georgetown University faculty provided continuing prostate cancer summer research opportunities for Hampton University undergraduate trainees:

1. Two of the Hampton students returned the following summer to continue their research projects.

Task 7. Georgetown University will continue to track the career progress of the Hampton University undergraduate students:

1. The career progress of the Hampton University is tracked by the Office of Cancer Research Education of the Lombardi Comprehensive Cancer Center of Georgetown University as illustrated below.

Students	HU-GU Fellow or Volunteer	Current Status
Aniema Nezesi	HU-GU Fellow Summer 2013	HU Class of 2014
Jeremy Smith	HU-GU Fellow Summer 2013	HU Class of 2017
Eve Reese	HU-GU Fellow Summer 2013	HU Class of 2015
Kimiko Krieger	HU-GU Fellow Summer 2013	HU Class of 2014
Nathan Wilson	HU-GU Fellow Summer 2013	HU Class of 2014
Eugide Othepa	HU-GU Fellow Summer 2012	Class of 2013; Hampton University MS Student Mathematics 2013-
Beverly Uweh	HU-GU Fellow Summer 2012	Class of 2013; Hampton University D. Pharm Student 1013-
Reena Blade	HU-GU Fellow Summer 2011 & 2012	Class of 2013; Virginia Common Wealth University applicant Forensic Chemistry
Kara Jordan	HU-GU Fellow Summer 2011	Class of 2012; Substitute Teacher, Newport News School District, VA
Chantel Thompson	HU-GU Fellow Summer 2011	Class of 2013; Pharmaceutical Sales, Manassass, VA
Emmen Udoh	HU-GU Fellow Summer 2011 & 2012	Class of 2013; Georgetown University MS 2014
Gerald Porter	HU-GU Fellow Summer 2010	Georgetown Graduate MS Student in Tumor Biology 2011-2012; applying to PhD programs in 2013
Shayna Whitney	HU-GU Fellow Summer 2010	Class of 2012; University of Maryland-College Park graduate student (part-time) Molecular Biology
Tiffany Lumpkin	HU-GU Fellow Summer 2010	Class of 2012; Johns Hopkins MS Biotechnology 2013
Zerin Scales	HU-GU Fellow Summer 2010	Class of 2013; Boston Univ. School of Medicine early admittance 2011
Tiffany Taliferro	Volunteer HU-GU Fellow 2010-11; HHMI Fellow; BIO 408 student	Georgetown Graduate Student – MS in Biochemsity 2011-2012; Research Associate Hampton University Skin of Color Research Institute
Wenners Ballard	Recruited Chemistry major, Class of 2010	Georgetown Tumor Biology MS 2010-2011; Howard Medical Student - Fall 2011
Krista Parker	Volunteer HU-GU Fellow; Battelle Scholar 2008-2010; BIO 408 Student	Ohio State Medical Student - Fall 2011-
Yampu Freeman	Volunteer HU-GU Fellow 2009	Columbia Graduate Student -Fall 2010-2013; Physicians Assistant applicant Summer 2013
Thomas Boddie	Volunteer HU-GU Fellow 2009; BIO 408 student	Howard Graduate Student - Fall 2011; U.S. Army OCS Candidate Spring 2013

Nicholas Archie	Volunteer HU-GU Fellow 2010; BIO 408 student	Predental Student Class of 2010; applying to Dental School in Fall 2013
Salim Quinn	Volunteer HU-GU Fellow 2009-2011; BIO 408 student	Hampton Graduate Student - Fall 2011; K-12 Math Teacher, Piscataway, NJ; applying to PhD programs in Molecular Biology in Fall 2013
Whitney Rose	Volunteer HU-GU Fellow 2010; BIO 408 student	Premedical Student Class of 2010; Physical Therapy Assistant; applying to PhD programs in Microbiology in Fall 2013

The table above summarizes the accomplishments of Fellows and Volunteers in the program. During the first year of funding, four students from HU conducted research on the mechanism of action of novel drugs on prostate cancer cell growth; on the role of BRCA1 and oxidative stress in prostate cancer; on the role of RARRES1, a tumor suppressor gene, in prostate cancer; and on the metabolomic profile of prostate cancer. During the second year of funding, four more students conducted research on the effects of radiation on prostate cancer cells, developing target-specific siRNA containing nanoparticles as tumor radiation and chemosensitizers, on the role of PCPH in prostate cancer, and on the mechanisms of radiation and chemotherapeutic resistance in prostate cancer. During the third year of funding, four students from HU conducted research on the mechanism of action of novel drugs that sensitize prostate tumors to radiation treatment; on the role of BRCA1 and oxidative stress in prostate cancer; on the role of the hippo-yap pathway in the proliferation of prostate cancer; and on the metabolomic profile of prostate cancer. During the fourth year of funding, five students from HU conducted research on the genetics of prostate cancer; the role of BRCA1 in prostate cancer; the mechanisms of endocrine resistant prostate cancer; the mechanisms of radiation and chemotherapeutic resistance in prostate cancer; and the mechanism of action of novel drugs that sensitize prostate tumors to radiation treatment. Over 60% of the students in the program have gone on to graduate and medical school.